IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
SAN ANTONIO DIVISION

SHANNON PEREZ, *et al.*, *Plaintiffs*, and EDDIE BERNICE JOHNSON, *et al.* and TEXAS LEGISLATIVE BLACK CAUCUS, TEXAS HOUSE OF REPRESENTATIVES and TEXAS CONFERENCE OF NAACP BRANCHES, *et al.* *Plaintiff-Intervenors,* v. STATE OF TEXAS, *et al.*, *Defendants*.	CIVIL ACTION NO. 11-CA-360-OLG-JES-XR [Lead case]

DEFENDANTS' DESIGNATION OF FACT WITNESSES, EXPERTS AND PROPOSED TRIAL EXHIBITS

EXPERT REPORT
OF
TODD GIBERSON

Report on District Compactness by Todd Giberson
August 22, 2011

Geographic compactness of districts has long been recognized as a goal in redistricting, and some important aspects of districting law have directly addressed district shape. In Thornburg v. Gingles [478 U.S. 30 (1986)], the Supreme Court described three conditions which must be met before considering a Section 2 violation of the Voting Right Act, the first being to demonstrate there is an unserved minority population "sufficiently large and *geographically compact* to constitute a majority in a single-member district." (emphasis added) Beginning with a Supreme Court ruling in Shaw v. Reno in 1993, the courts have rejected minority districts so "bizarre" in shape that the choice of boundary is "unexplainable on grounds other than race." (Sandra Day O'Connor in Shaw v. Reno). But in these two references to compactness or district shape, different thresholds are being contemplated. In Shaw, the courts discuss the point beyond which a minority district can no longer survive a legal challenge (extreme non-compactness). Gingles, however, references the point below which a jurisdiction is compelled to create a district to accommodate a minority population (reasonable compactness).

But how does one determine these thresholds? Defining geographic compactness in a numeric sense has not been a straightforward task. Often a district shape is evaluated as a geometric figure, to which formulas are applied to compute various measurements. And while we may be able to quickly assess the compactness of a district visually – by its elongated or sinuous shape, by its jagged boundaries, by protrusions of territory along the district edge, or by the lack of such features – no one measure or group of measures is adequate to establish clear guidelines. Still, these compactness measures can

be useful in comparing districts and in highlighting districts which are outliers in terms of non-compactness.

Accordingly, I have selected three common measures of compactness and generated values for each district in selected redistricting plans. The measures are[1]:

Perimeter to Area – Known as the Polsby-Popper test, this measure compares the area of the district with the area of a circle of the same perimeter, using the formula **4πArea / Perimeter^2**. This measure highlights convoluted, zig-zagging boundaries.

Area to Rubber Band[2] – compares the area of a district to the area of the minimum convex polygon (often called a convex hull) that surrounds the district as a geometric figure. The convex hull can be envisioned as the polygon created by stretching a rubber band around the district shape. The calculation is made as Area of District / Area of Convex Hull. This measure primarily highlights where a district has large bends in its overall shape, wrapping around parts of other districts.

Area to Smallest Circle – Also known as the Reock test, the ratio of the area of a district to the area of the smallest circle which will circumscribe the district boundary. The calculation is Area of District / Area of Smallest Circle and primarily highlights districts that are long and thin in shape.

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[1] Richard G. Niemi; Bernard Grofman; Carl Carlucci; Thomas Hofeller; "Measuring Compactness and the Role of a Compactness Standard in a Test for Partisan and Racial Gerrymandering, The Journal of Politics, Vol. 52, No. 4. (Nov. 1990), pp. 1155-1181

[2] Dis9 in Niemi, et al.

As described, each measure highlights a different aspect of compactness and yields a value in the range 0 to 1, with 1 being the value a circle would receive, as the most compact two-dimensional shape, while less compact shapes would receive a value closer to 0. These numbers are included on the attached reports. However, the reports also include numbers referred to under the heading "Reciprocal Calculation". The reciprocal measures are generated by simply reversing the dividend and divisor in each calculation. In this way, perfect circle would still receive a value of 1, but increasingly less-compact districts will receive increasingly higher scores. In my discussion, I refer exclusively to the reciprocal calculations as, in my experience, these numbers are more easily comprehended and do a better job of accentuating non-compact districts. These compactness calculations would work for any map or district for which the data are provided and I would be able to generate compactness numbers for other plans which may be proposed.

Table 1, on the following page, is provided to help establish an idea of what values might be expected for these three numbers, compiling scores for all Congressional districts used in any election since 1996 (the post-Shaw era). While not a comprehensive study, these numbers do represent values associated specifically with Congressional districts as applied to Texas geography.

Plaintiffs allege, with the passage of Congressional plan C185 and State House plan H283, that the state failed to draw additional Hispanic Congressional districts in the areas of either Dallas / Fort Worth or Harris County (Houston), or should have created additional State House districts. Plaintiffs have created several example districts in an effort to satisfy the first prong of the Gingles

	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
Average Score (mean)	6.4	1.5	3.2
Standard Deviation	3.7	0.2	1.0
One std. dev. above mean	10.1	1.7	4.2
	Top 5 least compact districts		
	37.4 (CD 6, 1996) [1]	2.3 (CD 6, 1996) [1]	8.5 (CD 25, 2004) [2]
	16.9 (CD 12, 1996) [1]	2.2 (CD 25, 2004) [2]	6.5 (CD 15, 2004) [2]
	11.8 (CD 25, 2002)	2.2 (CD 15, 2004) [2]	5.2 (CD 26, 2004)
	11.6 (CD 15, 2004) [2]	2.0 (four districts)	5.2 (CD 26, 2006)
	11.4 (CD 8, 1996)	2.0	5.1 (two districts)
			n =126 districts

1) CD 6 and CD 12 were adjacent districts in the Fort Worth area, drawn originally in 1991 for partisan, not racial/ethnic reasons and largely left intact after the court, in 1996, redrew nearby CD 30 in Dallas.
2) CD 25 and CD 15 were two of the long, thin districts connecting central Texas with the Rio Grande Valley in the 2004 Congressional district plan. These were both redrawn to be much more compact after nearby CD 23 was struck down by the Supreme Court in LULAC v. Perry.

Table 1

test. In the Dallas / Fort Worth area, I examined CD 6 in PLANC190[3], CD 34 in PLANC121[4], CD 5 in PLANC163[5] and the nearly identical CD 5 in PLANC164[6]. In Harris County I analyzed CD 36 in PLANC163 and the nearly

[3] Latino Taskforce Congressional Proposal

[4] Rep. Veasey (Sen. West S2-F2) St Sb (H2-F10) PLANC149

[5] Rep. Martinez-Fischer Stwd Sub 2 (H2-F13) PLANC149

[6] Rep. Martinez-Fischer Stwd Sub 1 (H2-F15) PLANC149

identical CD 36 in PLANC164 as well as CD 29 and CD 36 in PLANC190. I also examined State House districts HD 84 in PLANH205[7] and districts 81 and 87 in PLANH115[8].

Accompanying this report are outline maps of the districts and full copies of the plan compactness reports for the districts discussed (see Appendix)[9]. Compactness numbers for a given district will be represented as a series of three numbers separated by a slash (/), ie. 10.1 / 1.7 / 4.2, referring to Perimeter to Area, Area to Rubber Band, and Area to Smallest Circle compactness measures respectively.

Congressional Districts – Dallas / Fort Worth

District 6 in PLANC190 and District 34 in PLANC121

Viewing the outline maps for these districts, one can see they are similar in shape and enclose basically the same areas. The bulk of each district is in Dallas county but also extends into central Tarrant county. Of the two, District 6 (C190) is much more jagged and irregular along its border. These two configurations demonstrate the tradeoff often encountered when "fine tuning" a plan to increase minority numbers, by adding or subtracting blocks or small groups of blocks: the fine tuning will result in less compact districts. District 34 (C121) encloses an area with 66.2% Hispanic Voting Age Population

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[7] Rep. Martinez-Fischer Stwd Substitute 8 PLANH152

[8] MALDEF Statewide House Proposal 1

[9] Also included in the Appendix are compactness reports for the Congressional (PLANC185) and State House (PLANH283) districts enacted by the 82nd Legislature in 2011. These are provided for convenience and for comparison purposes.

(HVAP) and an estimated 45.6% Hispanic Citizen Voting Age Population (HCVAP). District 6 (C190) has a higher percent HVAP, 66.8%, and attains an HCVAP of 50.4% – but it has compactness scores that are the largest of all districts analyzed, 54.4 / 3.3 / 9.5. All three of these values are greater than any corresponding value in the districts compiled for Table 1. District 34 (C121) is slightly more compact, though still quite high at 23.4 / 3.0 / 7.7.

District 5 in PLANC163 and PLANC164

The maps show that these two districts are almost identical. Except for a small two-block area in Tarrant County, these districts are drawn entirely within Dallas County. The compactness values for this district in PLANC163 are 13.3 / 2.0 / 3.1 and for PLANC164 the values are 13.7 / 2.0 / 3.1. The convoluted boundaries stand out, as does the wispy, narrowly connected protrusion to the east causing values for the first measures to be on the high end.

Congressional Districts – Harris County

Districts 29 and 36 in PLANC190

Historically, CD 29 has connected two distinct but proximate centers of Hispanic population, one north of downtown Houston and another to the southeast. In PLANC190 these two centers of Hispanic population are severed to form the core of two separate districts. District 29 has compactness values of 16.0 / 2.1 / 4.0 with an HVAP percent of 59.0 and 35.7% HCVAP. In the southeastern part of the county, district 36 has compactness scores of 11.5 / 1.7 / 2.6, with an HVAP of 65.6% and a HCVAP of 50.1%.

District 36 in PLANC163 and PLANC164

The existing Hispanic-majority district in Harris county, district 29, is essentially maintained in its current form, with both large cores of Hispanic population remaining in the district. District 136, however, encloses some additional areas of Hispanic population in the western part of the county. In both plans the district configuration is nearly identical. The compactness scores for PLANC163 and PLANC164 are 10.5 / 2.1 / 3.8 and 10.4 / 2.1 / 3.8, respectively. However, the Hispanic numbers are only 51.0% HVAP and less than 27% HCVAP in either plan.

House Districts - West Texas

District 87 in PLANH115 and District 84 in PLANH205[10]

District 84 in PLANH205 covers parts of 13 counties in west Texas, taking parts of cities from Amarillo to Lubbock to Lamesa. District 87 in PLANH115 is similarly constructed, although it only reaches into parts of 10 counties. The compactness scores for District 84 (H205) are 23.9 / 2.9 / 5.8, all of which put this district among the least compact. District 87 (H115) carries scores only slightly lower of 16.0 / 2.5 / 5.7.

District 81 in PLANH115 and PLANH205

District 81 in PLANH115 extends along I-20 from Pecos to Big Spring, taking

[10] This analysis does not address the "county line rule" as set forth in Article 3 Sec. 26 of the Texas Constitution.

in portions of Odessa and Midland. District 81 in PLANH205 begins farther west in Hudspeth County and goes no further east than Midland. The compactness scores for the H115 version are 7.8 / 2.1 / 4.5, while the H205 configuration are 4.3 / 1.4 / 3.5. The scores for these districts are benefitted by the inclusion of whole counties on the west side but exhibit a greater non-compactness on the eastern side.

All four of the House districts discussed here surpass the 50% HCVAP threshold.

Conclusion

In a Section 2 claim, the standard is not whether a district shape crosses the line into an impermissible racial gerrymander, but whether a district is reasonably geographically compact such that the State is compelled to create a district to accommodate a minority population. Based on a compactness scoring system coupled with visual observation of the shapes of districts fashioned as potential new Hispanic-majority districts, none are compelling by shape alone.[11]

Dated: August 22, 2011

Todd C. Giberson

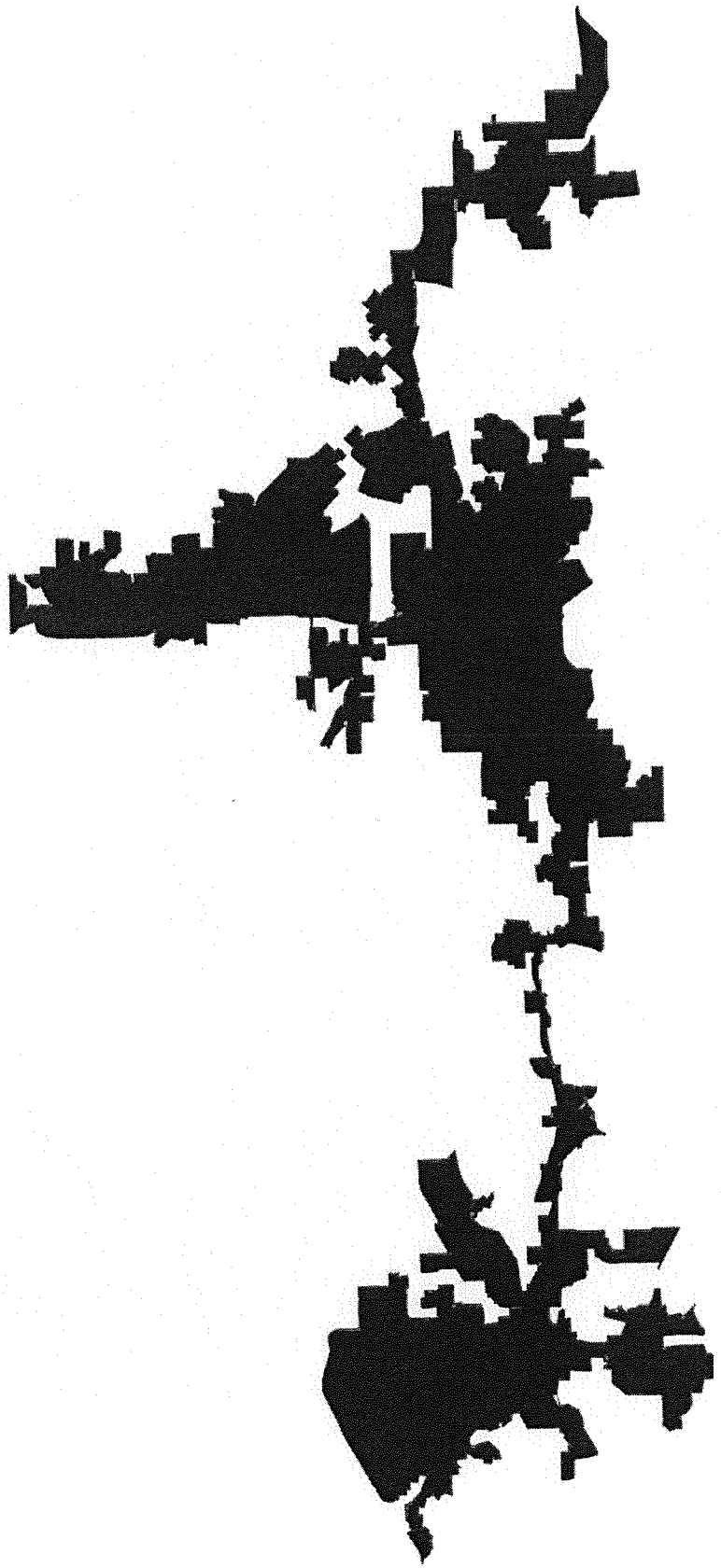
[11] Moreover, the mere fact that a district is compact does not, of itself, require the district to be drawn. I do not address any additional legal requirements which must be in place before a jurisdiction would be compelled to draw a district under Section 2 of the Voting Rights Act. Also, I do not evaluate any of these districts against the standard of a racial gerrymandering claim.

Todd Giberson, a staff analyst for the Texas Office of the Attorney General, testified as an expert witness on behalf of the State regarding district compactness following the 2003 legislative redistricting of Congressional districts.

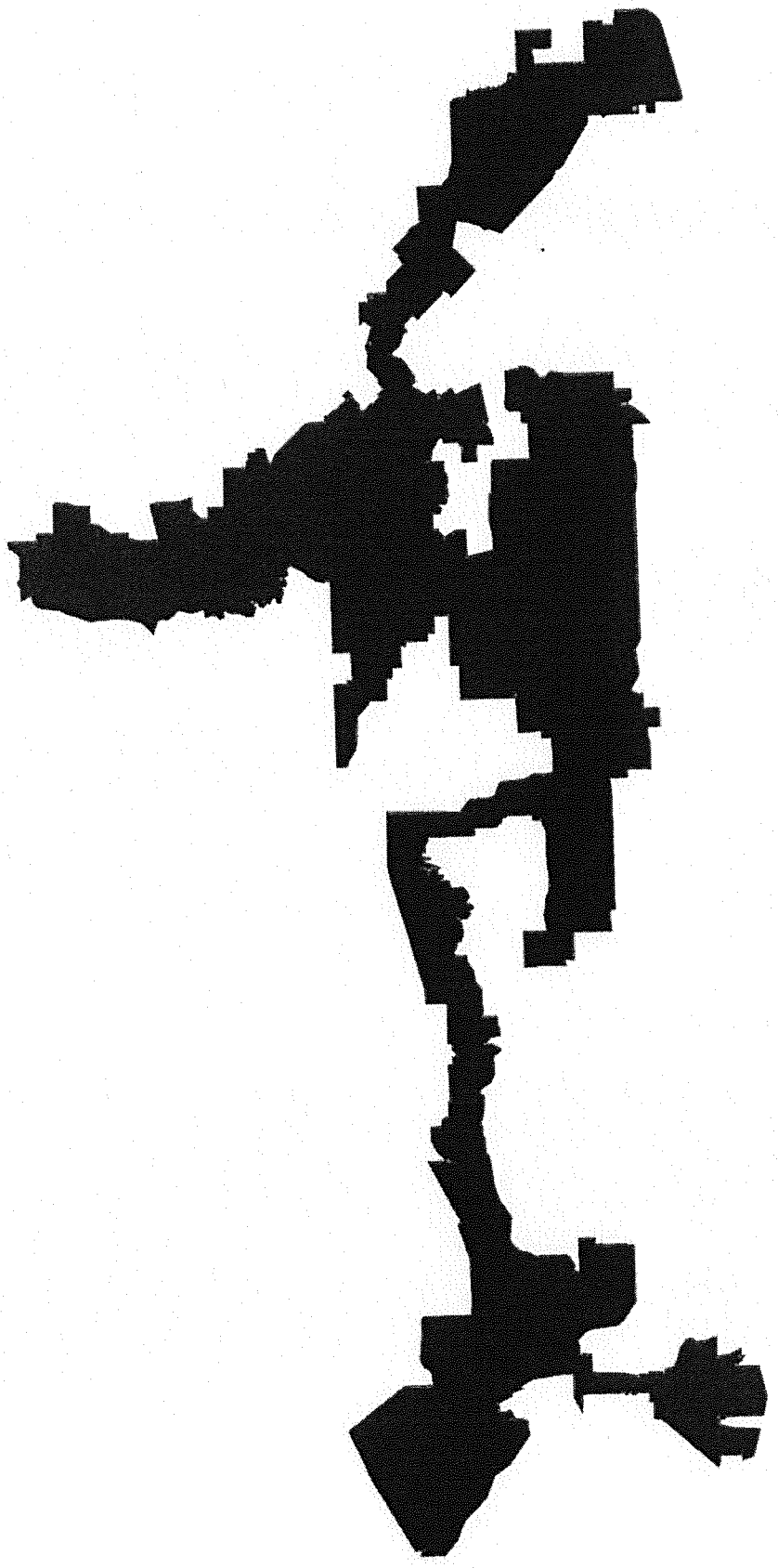
Todd graduated Summa Cum Laude from Southwest Texas State University (now Texas State) with a degree in Geography and was selected as "Outstanding Senior" his final year. He served as a Programmer/Analyst at the Texas Legislative Council during the 1990's round of redistricting when the original RedAppl redistricting software was developed. Todd first came to the Office of the Attorney General in 1994 where he continued to be involved in all aspects of redistricting analysis as well as other Geographic Information Systems (GIS) projects such as the development of the agency's Colonia Geographic Database.

Appendix

Maps and Reports

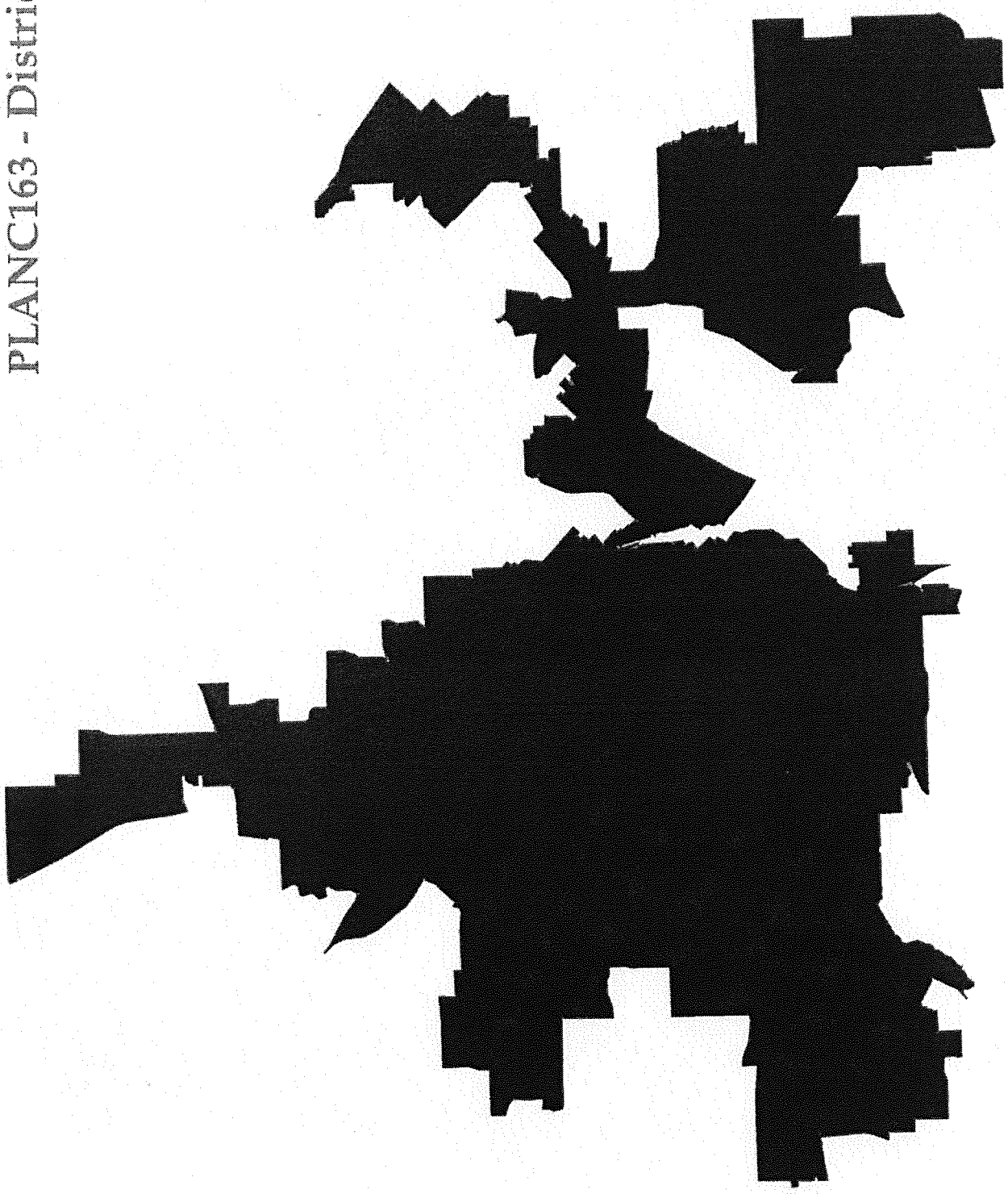


PLANC190 - District 6

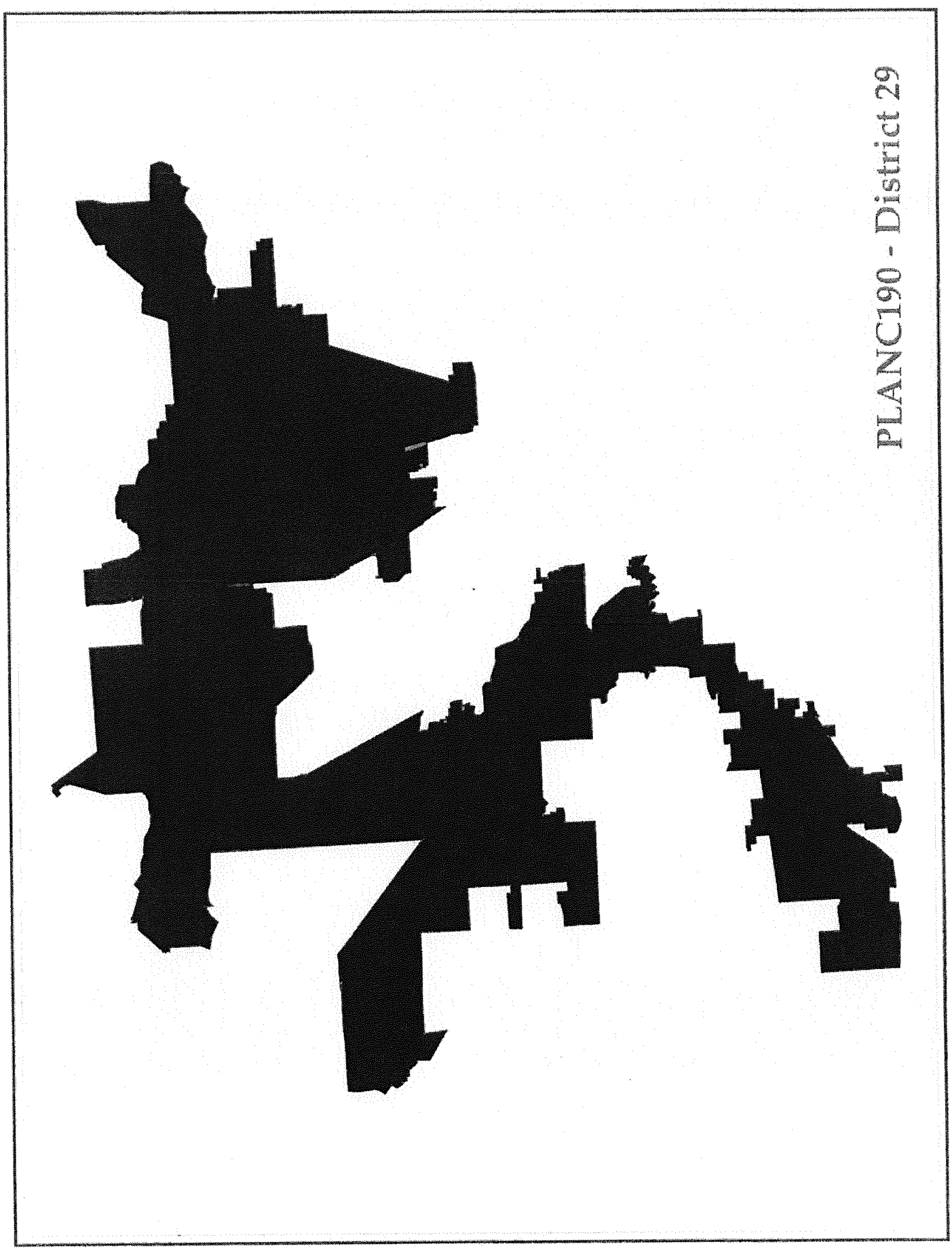


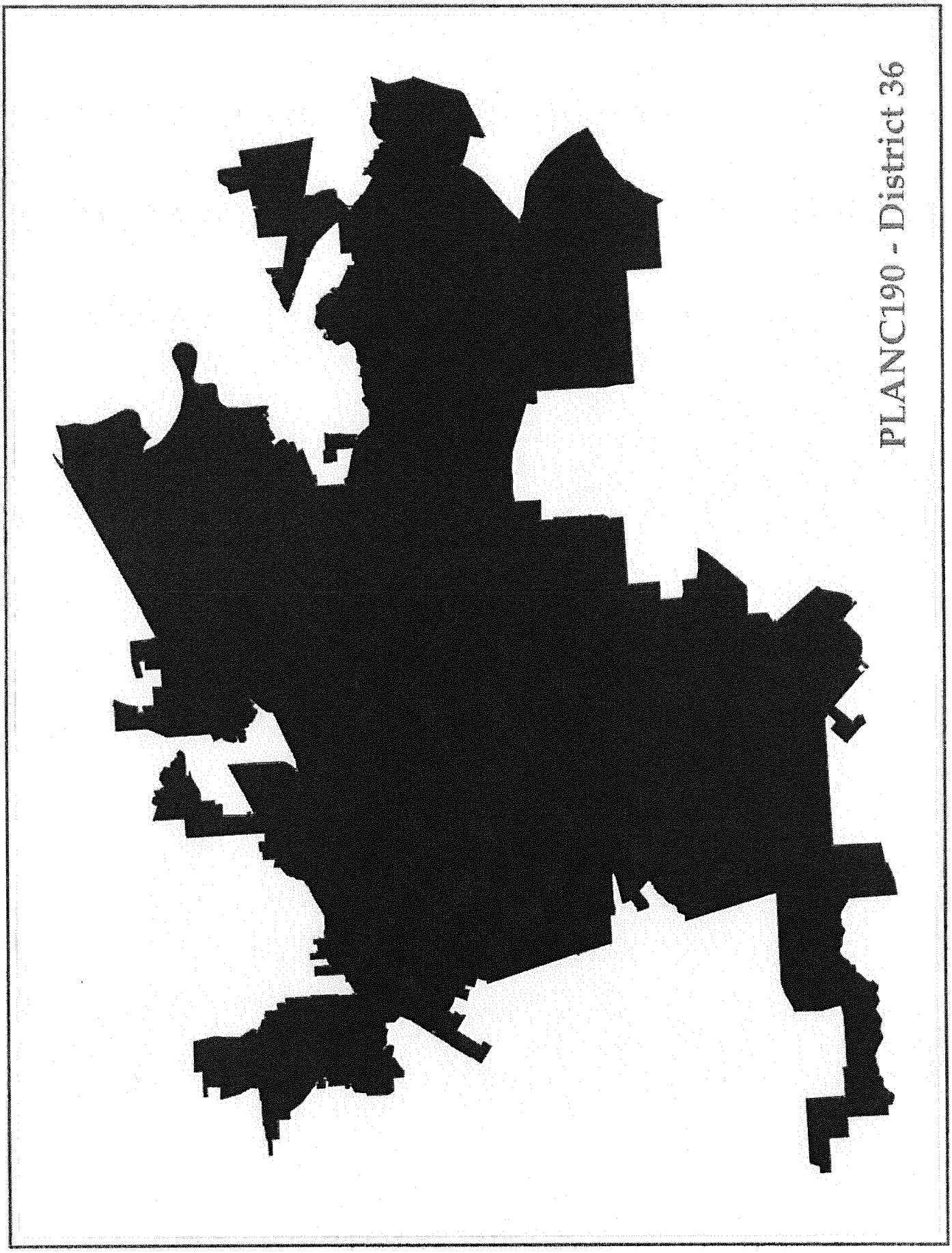
PLANC121 - District 34

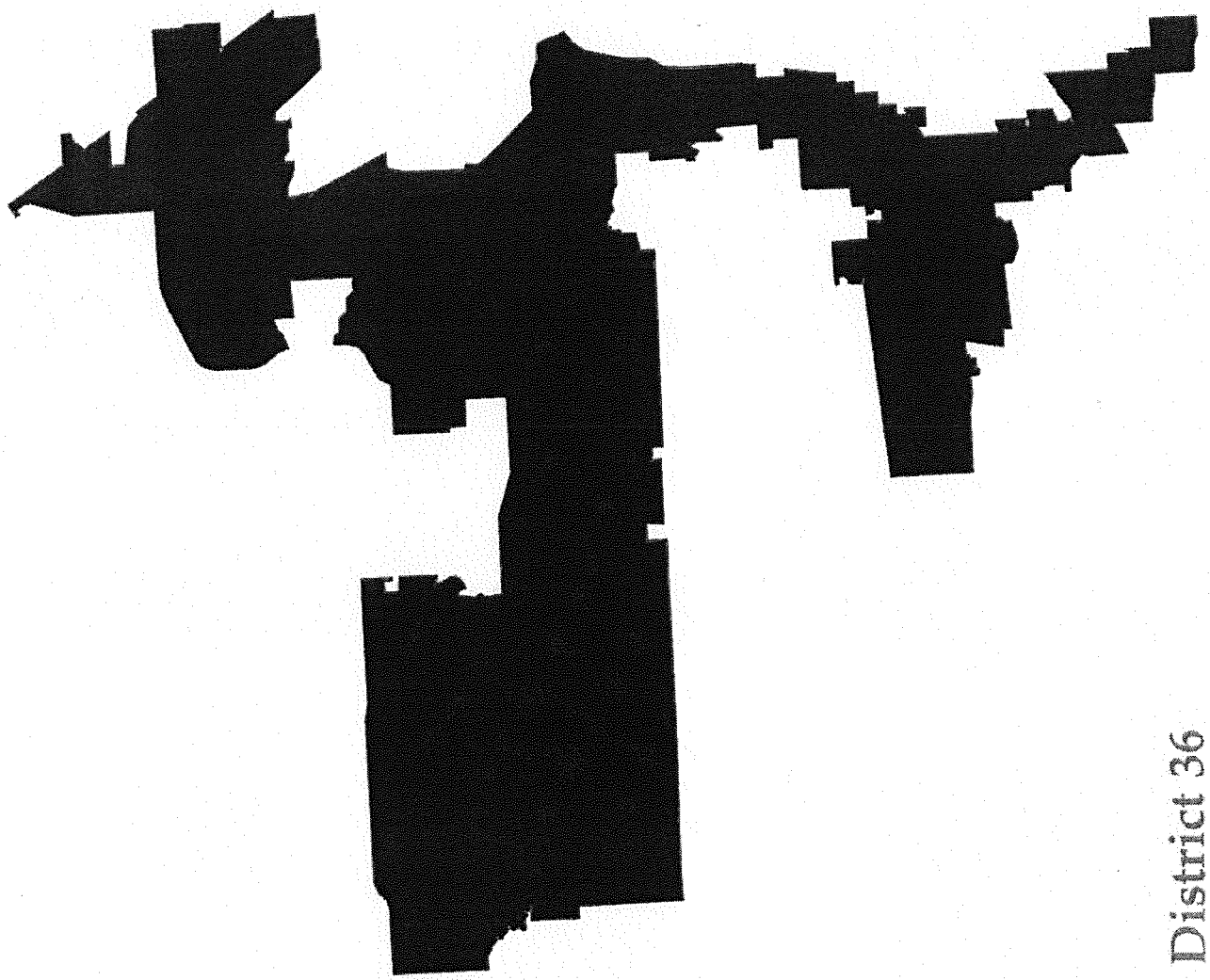
PLANC163 - District 5



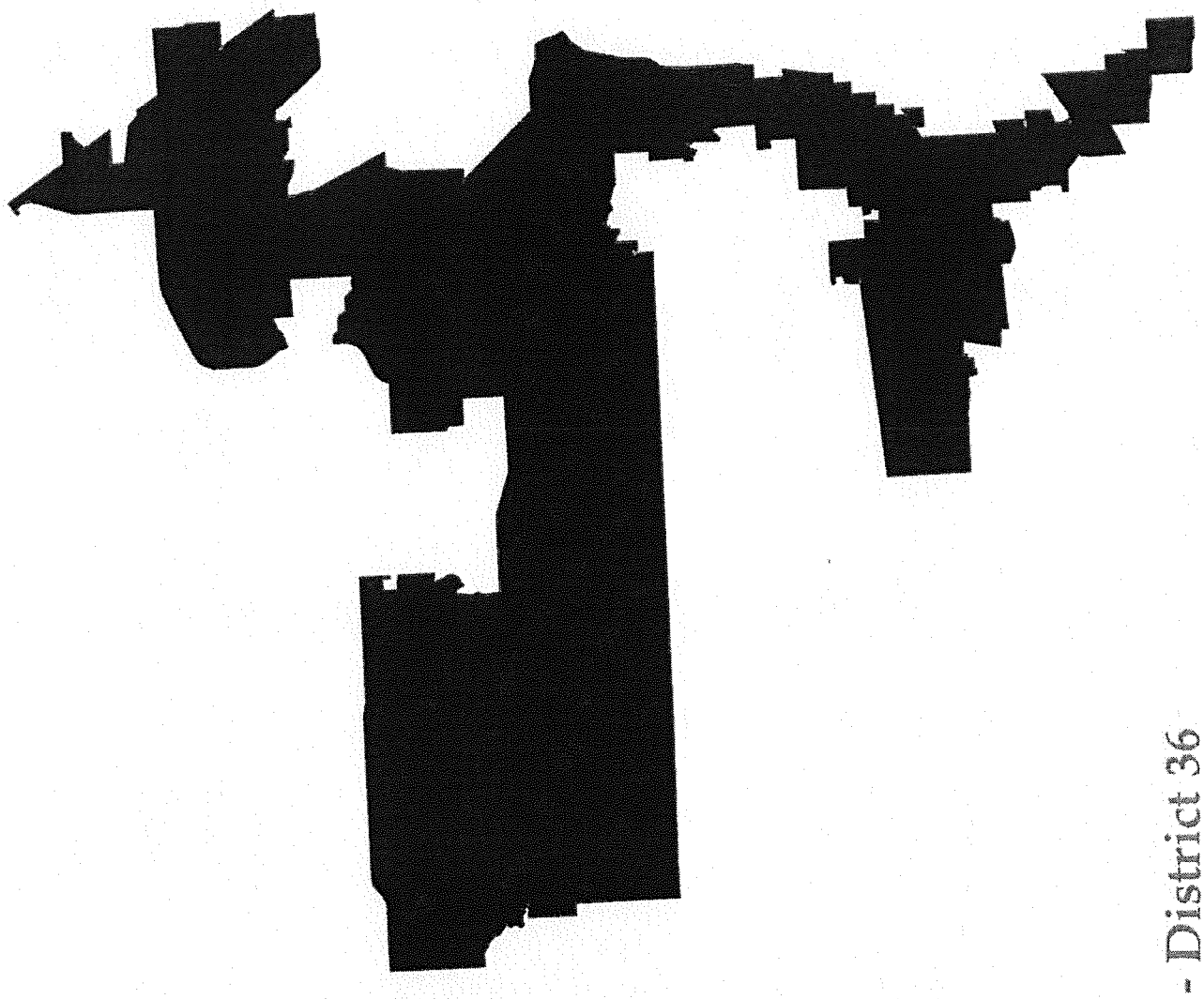
PLANC164 - District 5


PLANC190 - District 29

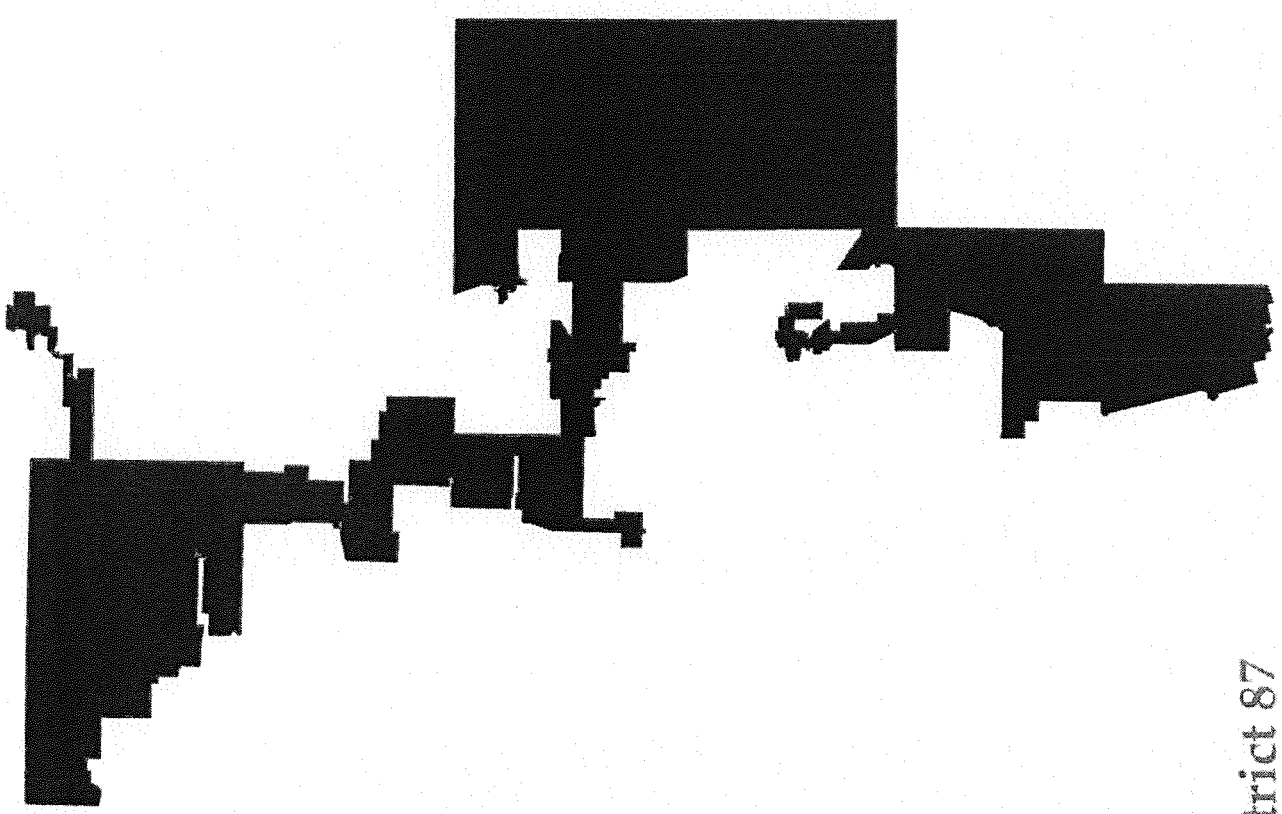

PLANC190 - District 36



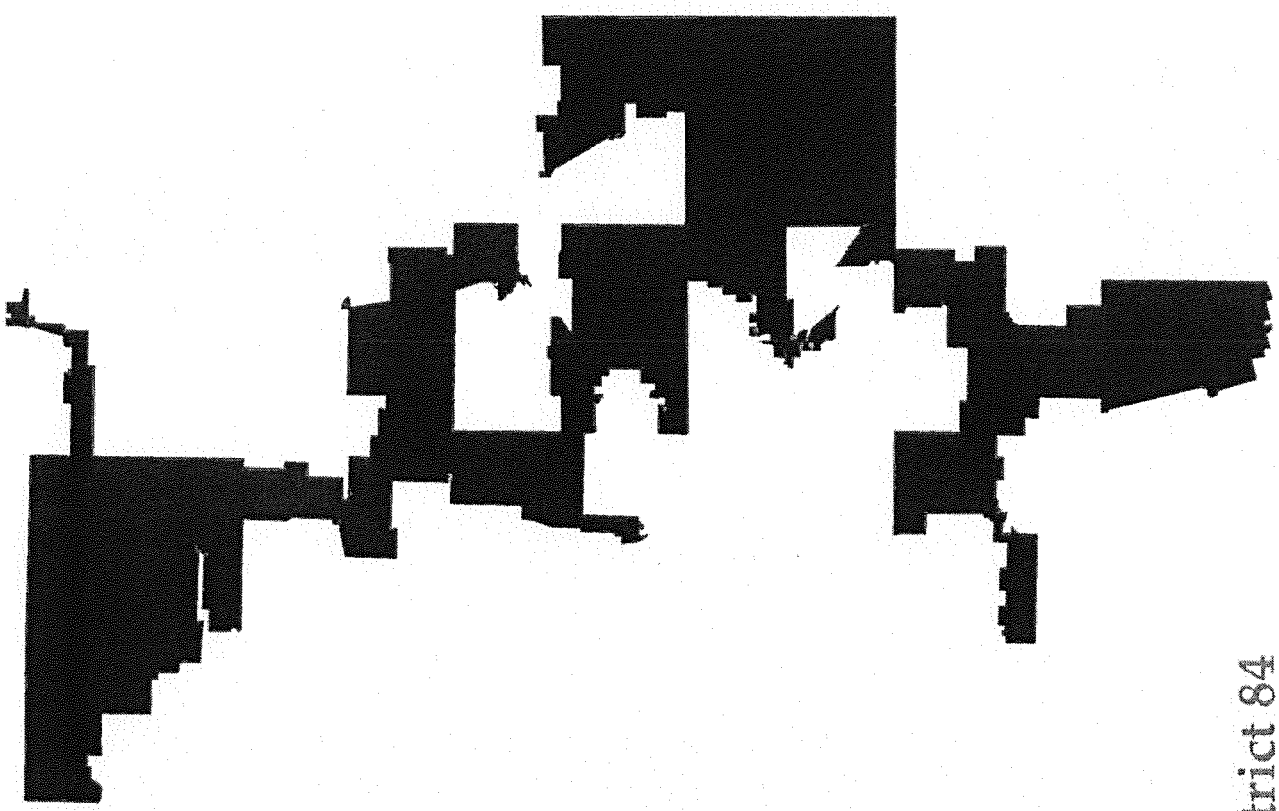
PLANC163 - District 36



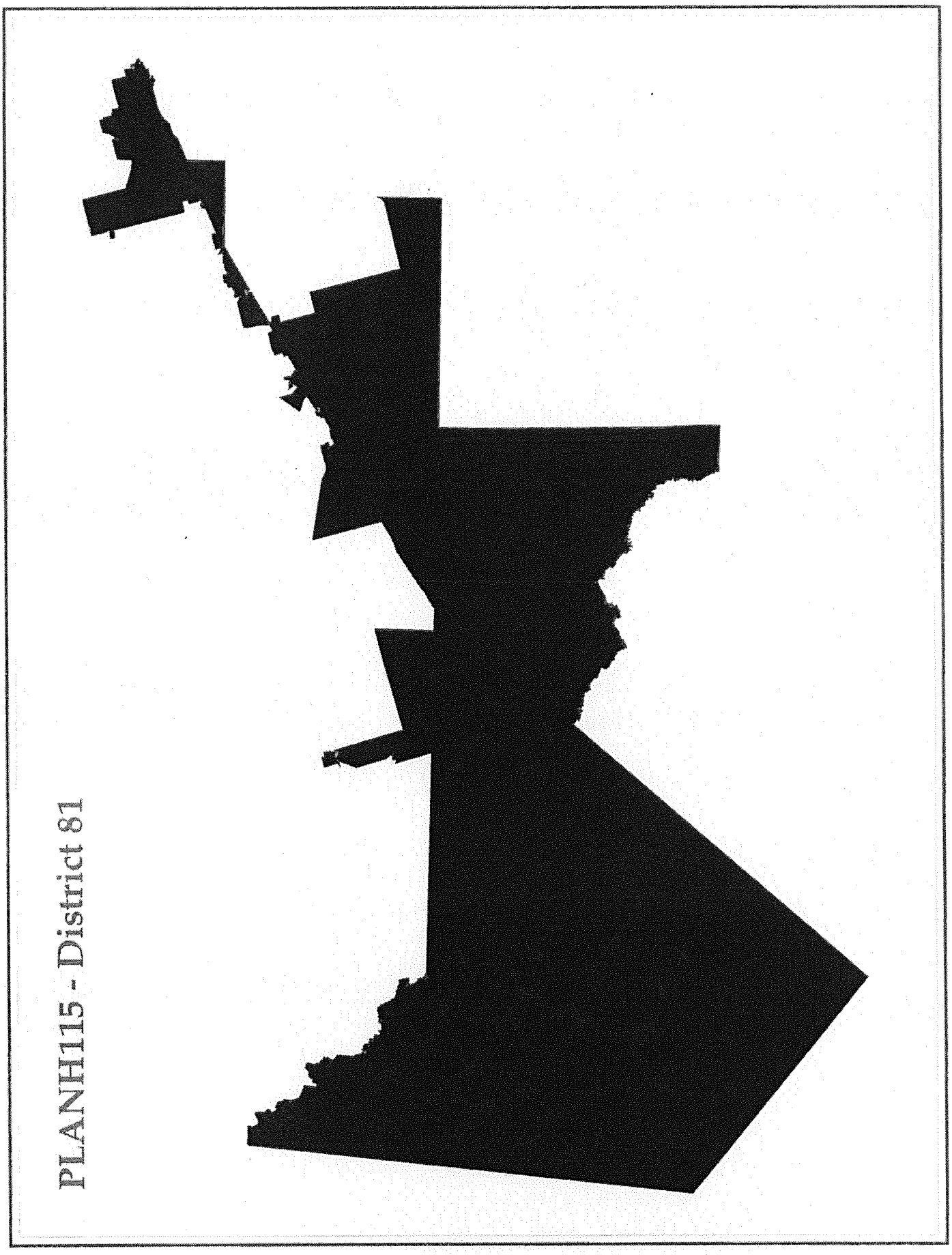
PLANC164 - District 36

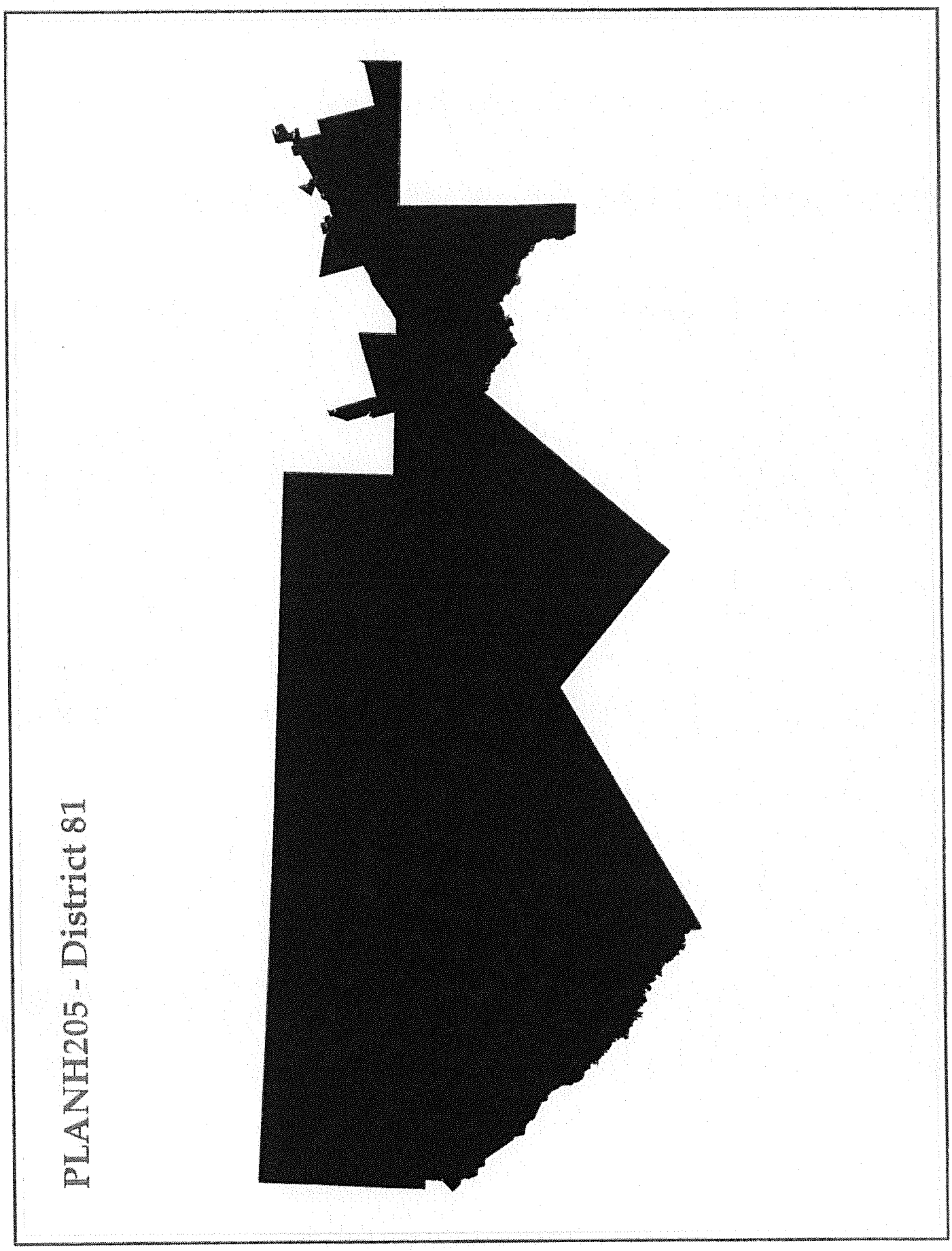


PLANH115 - District 87



PLANH205 - District 84


PLANH115 - District 81


PLANH205 - District 81

Compactness Measures

Plan ID: PLANC121

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.156	0.727	0.292	6.4	1.4	3.4
2	0.129	0.622	0.142	7.7	1.6	7.1
3	0.543	0.922	0.537	1.8	1.1	1.9
4	0.135	0.662	0.270	7.4	1.5	3.7
5	0.144	0.642	0.363	6.9	1.6	2.8
6	0.223	0.672	0.294	4.5	1.5	3.4
7	0.206	0.680	0.340	4.9	1.5	2.9
8	0.174	0.719	0.408	5.7	1.4	2.5
9	0.183	0.646	0.330	5.5	1.5	3.0
10	0.309	0.814	0.469	3.2	1.2	2.1
11	0.211	0.673	0.297	4.7	1.5	3.4
12	0.331	0.862	0.426	3.0	1.2	2.3
13	0.392	0.777	0.433	2.5	1.3	2.3
14	0.253	0.726	0.442	3.9	1.4	2.3
15	0.137	0.545	0.210	7.3	1.8	4.8
16	0.297	0.709	0.343	3.4	1.4	2.9
17	0.283	0.766	0.471	3.5	1.3	2.1
18	0.096	0.592	0.419	10.4	1.7	2.4
19	0.314	0.760	0.407	3.2	1.3	2.5
20	0.161	0.635	0.380	6.2	1.6	2.6
21	0.299	0.811	0.517	3.3	1.2	1.9
22	0.100	0.512	0.221	10.0	2.0	4.5
23	0.166	0.574	0.240	6.0	1.7	4.2
24	0.155	0.582	0.271	6.5	1.7	3.7
25	0.260	0.738	0.436	3.8	1.4	2.3
26	0.274	0.704	0.434	3.7	1.4	2.3
27	0.236	0.800	0.326	4.2	1.2	3.1
28	0.152	0.613	0.188	6.6	1.6	5.3
29	0.085	0.603	0.372	11.8	1.7	2.7
30	0.114	0.661	0.436	8.8	1.5	2.3
31	0.209	0.666	0.514	4.8	1.5	1.9
32	0.159	0.724	0.416	6.3	1.4	2.4
33	0.164	0.523	0.196	6.1	1.9	5.1
34	0.043	0.331	0.130	23.4	3.0	7.7
35	0.100	0.571	0.247	10.0	1.7	4.0
36	0.240	0.722	0.306	4.2	1.4	3.3

Compactness Measures

Plan ID: PLANC163

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.296	0.865	0.408	3.4	1.2	2.4
2	0.193	0.681	0.443	5.2	1.5	2.3
3	0.411	0.881	0.600	2.4	1.1	1.7
4	0.201	0.766	0.358	5.0	1.3	2.8
5	0.075	0.510	0.319	13.3	2.0	3.1
6	0.308	0.754	0.518	3.2	1.3	1.9
7	0.199	0.680	0.266	5.0	1.5	3.8
8	0.269	0.854	0.667	3.7	1.2	1.5
9	0.118	0.624	0.333	8.5	1.6	3.0
10	0.143	0.661	0.304	7.0	1.5	3.3
11	0.329	0.828	0.338	3.0	1.2	3.0
12	0.131	0.650	0.342	7.6	1.5	2.9
13	0.232	0.629	0.261	4.3	1.6	3.8
14	0.171	0.696	0.225	5.8	1.4	4.4
15	0.088	0.558	0.176	11.4	1.8	5.7
16	0.479	0.919	0.462	2.1	1.1	2.2
17	0.196	0.735	0.309	5.1	1.4	3.2
18	0.084	0.581	0.402	11.9	1.7	2.5
19	0.273	0.716	0.299	3.7	1.4	3.3
20	0.282	0.816	0.633	3.5	1.2	1.6
21	0.318	0.761	0.414	3.1	1.3	2.4
22	0.149	0.625	0.346	6.7	1.6	2.9
23	0.189	0.733	0.236	5.3	1.4	4.2
24	0.279	0.827	0.396	3.6	1.2	2.5
25	0.171	0.695	0.349	5.8	1.4	2.9
26	0.538	0.887	0.578	1.9	1.1	1.7
27	0.271	0.771	0.355	3.7	1.3	2.8
28	0.169	0.587	0.317	5.9	1.7	3.2
29	0.110	0.651	0.343	9.1	1.5	2.9
30	0.122	0.664	0.414	8.2	1.5	2.4
31	0.207	0.671	0.310	4.8	1.5	3.2
32	0.086	0.633	0.309	11.7	1.6	3.2
33	0.120	0.585	0.198	8.4	1.7	5.0
34	0.310	0.875	0.603	3.2	1.1	1.7
35	0.063	0.427	0.193	15.8	2.3	5.2
36	0.095	0.486	0.262	10.5	2.1	3.8

Compactness Measures

Plan ID: PLANC164

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.129	0.702	0.257	7.7	1.4	3.9
2	0.221	0.797	0.589	4.5	1.3	1.7
3	0.304	0.871	0.477	3.3	1.1	2.1
4	0.177	0.780	0.375	5.7	1.3	2.7
5	0.073	0.509	0.319	13.7	2.0	3.1
6	0.184	0.691	0.324	5.4	1.4	3.1
7	0.133	0.676	0.430	7.5	1.5	2.3
8	0.306	0.832	0.458	3.3	1.2	2.2
9	0.114	0.620	0.332	8.8	1.6	3.0
10	0.201	0.645	0.331	5.0	1.6	3.0
11	0.211	0.673	0.367	4.7	1.5	2.7
12	0.064	0.430	0.195	15.7	2.3	5.1
13	0.262	0.672	0.298	3.8	1.5	3.4
14	0.222	0.686	0.252	4.5	1.5	4.0
15	0.153	0.578	0.236	6.6	1.7	4.2
16	0.260	0.694	0.305	3.8	1.4	3.3
17	0.163	0.746	0.212	6.1	1.3	4.7
18	0.080	0.571	0.385	12.4	1.8	2.6
19	0.279	0.706	0.378	3.6	1.4	2.6
20	0.131	0.652	0.330	7.6	1.5	3.0
21	0.137	0.663	0.329	7.3	1.5	3.0
22	0.130	0.624	0.263	7.7	1.6	3.8
23	0.159	0.609	0.235	6.3	1.6	4.3
24	0.298	0.807	0.387	3.4	1.2	2.6
25	0.296	0.859	0.370	3.4	1.2	2.7
26	0.300	0.773	0.398	3.3	1.3	2.5
27	0.133	0.625	0.326	7.5	1.6	3.1
28	0.180	0.655	0.210	5.5	1.5	4.8
29	0.110	0.653	0.345	9.1	1.5	2.9
30	0.122	0.663	0.413	8.2	1.5	2.4
31	0.229	0.692	0.346	4.4	1.4	2.9
32	0.056	0.488	0.171	17.9	2.0	5.9
33	0.258	0.803	0.316	3.9	1.2	3.2
34	0.117	0.615	0.297	8.5	1.6	3.4
35	0.181	0.664	0.397	5.5	1.5	2.5
36	0.096	0.486	0.262	10.4	2.1	3.8

Compactness Measures

Plan ID: PLANC185

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.203	0.768	0.424	4.9	1.3	2.4
2	0.131	0.497	0.301	7.6	2.0	3.3
3	0.371	0.871	0.505	2.7	1.1	2.0
4	0.175	0.780	0.375	5.7	1.3	2.7
5	0.132	0.684	0.317	7.6	1.5	3.2
6	0.204	0.725	0.377	4.9	1.4	2.7
7	0.170	0.645	0.400	5.9	1.6	2.5
8	0.235	0.840	0.625	4.2	1.2	1.6
9	0.104	0.538	0.255	9.7	1.9	3.9
10	0.154	0.725	0.304	6.5	1.4	3.3
11	0.200	0.616	0.340	5.0	1.6	2.9
12	0.109	0.744	0.497	9.2	1.3	2.0
13	0.262	0.672	0.298	3.8	1.5	3.4
14	0.160	0.570	0.236	6.3	1.8	4.2
15	0.124	0.521	0.146	8.1	1.9	6.9
16	0.565	0.942	0.485	1.8	1.1	2.1
17	0.191	0.673	0.442	5.2	1.5	2.3
18	0.064	0.493	0.280	15.6	2.0	3.6
19	0.279	0.706	0.378	3.6	1.4	2.6
20	0.149	0.652	0.447	6.7	1.5	2.2
21	0.192	0.773	0.357	5.2	1.3	2.8
22	0.145	0.708	0.376	6.9	1.4	2.7
23	0.205	0.728	0.283	4.9	1.4	3.5
24	0.213	0.749	0.378	4.7	1.3	2.6
25	0.160	0.607	0.268	6.3	1.6	3.7
26	0.241	0.754	0.364	4.2	1.3	2.7
27	0.192	0.619	0.360	5.2	1.6	2.8
28	0.104	0.424	0.198	9.6	2.4	5.1
29	0.082	0.646	0.339	12.2	1.5	2.9
30	0.253	0.814	0.509	4.0	1.2	2.0
31	0.455	0.817	0.602	2.2	1.2	1.7
32	0.120	0.604	0.360	8.3	1.7	2.8
33	0.143	0.600	0.394	7.0	1.7	2.5
34	0.123	0.572	0.179	8.1	1.7	5.6
35	0.054	0.364	0.095	18.4	2.7	10.5
36	0.209	0.782	0.450	4.8	1.3	2.2

Compactness Measures

Plan ID: PLANC190

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.203	0.768	0.424	4.9	1.3	2.4
2	0.165	0.725	0.497	6.1	1.4	2.0
3	0.371	0.871	0.505	2.7	1.1	2.0
4	0.175	0.780	0.375	5.7	1.3	2.7
5	0.143	0.678	0.315	7.0	1.5	3.2
6	0.018	0.303	0.105	54.4	3.3	9.5
7	0.295	0.775	0.453	3.4	1.3	2.2
8	0.239	0.768	0.569	4.2	1.3	1.8
9	0.144	0.596	0.340	6.9	1.7	2.9
10	0.178	0.656	0.363	5.6	1.5	2.8
11	0.247	0.760	0.376	4.1	1.3	2.7
12	0.182	0.785	0.407	5.5	1.3	2.5
13	0.262	0.672	0.298	3.8	1.5	3.4
14	0.171	0.530	0.275	5.8	1.9	3.6
15	0.098	0.489	0.148	10.3	2.0	6.7
16	0.565	0.942	0.485	1.8	1.1	2.1
17	0.245	0.774	0.475	4.1	1.3	2.1
18	0.053	0.521	0.277	18.8	1.9	3.6
19	0.279	0.706	0.378	3.6	1.4	2.6
20	0.127	0.617	0.425	7.9	1.6	2.4
21	0.279	0.744	0.352	3.6	1.3	2.8
22	0.147	0.718	0.574	6.8	1.4	1.7
23	0.134	0.597	0.195	7.5	1.7	5.1
24	0.144	0.747	0.334	7.0	1.3	3.0
25	0.224	0.634	0.350	4.5	1.6	2.9
26	0.627	0.958	0.620	1.6	1.0	1.6
27	0.204	0.680	0.406	4.9	1.5	2.5
28	0.170	0.636	0.274	5.9	1.6	3.6
29	0.062	0.486	0.249	16.0	2.1	4.0
30	0.172	0.859	0.428	5.8	1.2	2.3
31	0.455	0.817	0.602	2.2	1.2	1.7
32	0.119	0.608	0.260	8.4	1.6	3.9
33	0.268	0.794	0.414	3.7	1.3	2.4
34	0.287	0.810	0.330	3.5	1.2	3.0
35	0.054	0.364	0.095	18.4	2.7	10.5
36	0.087	0.597	0.381	11.5	1.7	2.6

Compactness Measures

Plan ID: PLANH115

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.249	0.765	0.356	4.0	1.3	2.8
2	0.377	0.722	0.444	2.7	1.4	2.3
3	0.094	0.623	0.336	10.6	1.6	3.0
4	0.242	0.656	0.314	4.1	1.5	3.2
5	0.424	0.808	0.415	2.4	1.2	2.4
6	0.501	0.921	0.559	2.0	1.1	1.8
7	0.370	0.846	0.427	2.7	1.2	2.3
8	0.228	0.701	0.276	4.4	1.4	3.6
9	0.153	0.731	0.356	6.6	1.4	2.8
10	0.387	0.778	0.448	2.6	1.3	2.2
11	0.159	0.637	0.252	6.3	1.6	4.0
12	0.182	0.771	0.557	5.5	1.3	1.8
13	0.148	0.653	0.427	6.8	1.5	2.3
14	0.185	0.726	0.407	5.4	1.4	2.5
15	0.213	0.639	0.293	4.7	1.6	3.4
16	0.235	0.705	0.408	4.3	1.4	2.4
17	0.307	0.702	0.411	3.3	1.4	2.4
18	0.251	0.659	0.290	4.0	1.5	3.5
19	0.129	0.589	0.232	7.8	1.7	4.3
20	0.213	0.626	0.273	4.7	1.6	3.7
21	0.182	0.638	0.344	5.5	1.6	2.9
22	0.073	0.445	0.262	13.8	2.2	3.8
23	0.348	0.828	0.373	2.9	1.2	2.7
24	0.205	0.696	0.366	4.9	1.4	2.7
25	0.471	0.899	0.334	2.1	1.1	3.0
26	0.267	0.787	0.477	3.8	1.3	2.1
27	0.308	0.791	0.490	3.2	1.3	2.0
28	0.348	0.829	0.584	2.9	1.2	1.7
29	0.202	0.659	0.324	4.9	1.5	3.1
30	0.158	0.575	0.338	6.3	1.7	3.0
31	0.231	0.663	0.256	4.3	1.5	3.9
32	0.171	0.703	0.428	5.8	1.4	2.3
33	0.354	0.739	0.397	2.8	1.4	2.5
34*	0.360	0.837	0.520	2.8	1.2	1.9
35	0.169	0.646	0.289	5.9	1.5	3.5
36	0.109	0.492	0.229	9.2	2.0	4.4
37	0.312	0.833	0.531	3.2	1.2	1.9
38	0.146	0.625	0.351	6.8	1.6	2.9
39	0.332	0.819	0.474	3.0	1.2	2.1
40	0.099	0.472	0.249	10.1	2.1	4.0
41	0.191	0.664	0.448	5.2	1.5	2.2
42	0.132	0.540	0.322	7.5	1.9	3.1
43	0.194	0.635	0.313	5.2	1.6	3.2
44	0.443	0.839	0.426	2.3	1.2	2.3
45	0.545	0.830	0.438	1.8	1.2	2.3
46	0.262	0.805	0.551	3.8	1.2	1.8
47	0.204	0.781	0.272	4.9	1.3	3.7
48	0.158	0.677	0.355	6.3	1.5	2.8
49	0.172	0.570	0.217	5.8	1.8	4.6
50	0.138	0.524	0.275	7.3	1.9	3.6
51	0.331	0.837	0.528	3.0	1.2	1.9

52	0.356	0.799	0.466	2.8	1.3	2.1
53	0.242	0.579	0.364	4.1	1.7	2.7
54	0.296	0.716	0.324	3.4	1.4	3.1
55	0.386	0.848	0.529	2.6	1.2	1.9
56	0.328	0.889	0.529	3.1	1.1	1.9
57	0.259	0.779	0.531	3.9	1.3	1.9
58	0.478	0.803	0.382	2.1	1.2	2.6
59	0.228	0.650	0.393	4.4	1.5	2.5
60	0.242	0.662	0.287	4.1	1.5	3.5
61	0.350	0.723	0.314	2.9	1.4	3.2
62	0.199	0.725	0.375	5.0	1.4	2.7
63	0.408	0.869	0.519	2.5	1.2	1.9
64	0.233	0.743	0.332	4.3	1.3	3.0
65	0.337	0.771	0.319	3.0	1.3	3.1
66	0.421	0.774	0.487	2.4	1.3	2.1
67	0.256	0.693	0.438	3.9	1.4	2.3
68	0.210	0.656	0.395	4.8	1.5	2.5
69	0.369	0.805	0.489	2.7	1.2	2.0
70	0.340	0.813	0.527	2.9	1.2	1.9
71	0.346	0.817	0.579	2.9	1.2	1.7
72	0.212	0.577	0.288	4.7	1.7	3.5
73	0.358	0.729	0.334	2.8	1.4	3.0
74	0.192	0.663	0.278	5.2	1.5	3.6
75	0.525	0.897	0.528	1.9	1.1	1.9
76	0.334	0.713	0.417	3.0	1.4	2.4
77	0.185	0.560	0.188	5.4	1.8	5.3
78	0.257	0.720	0.313	3.9	1.4	3.2
79	0.410	0.884	0.343	2.4	1.1	2.9
80	0.572	0.851	0.590	1.7	1.2	1.7
81	0.128	0.479	0.223	7.8	2.1	4.5
82	0.201	0.691	0.432	5.0	1.4	2.3
83	0.211	0.840	0.417	4.7	1.2	2.4
84	0.265	0.746	0.501	3.8	1.3	2.0
85	0.165	0.536	0.254	6.0	1.9	3.9
86	0.513	0.829	0.476	1.9	1.2	2.1
87	0.062	0.395	0.174	16.0	2.5	5.7
88	0.359	0.808	0.435	2.8	1.2	2.3
89	0.373	0.797	0.435	2.7	1.3	2.3
90	0.086	0.556	0.314	11.6	1.8	3.2
91	0.348	0.800	0.524	2.9	1.2	1.9
92	0.371	0.765	0.371	2.7	1.3	2.7
93	0.297	0.700	0.464	3.4	1.4	2.2
94	0.215	0.788	0.329	4.6	1.3	3.0
95	0.108	0.608	0.258	9.2	1.6	3.9
96	0.214	0.600	0.258	4.7	1.7	3.9
97	0.247	0.744	0.450	4.1	1.3	2.2
98	0.454	0.836	0.424	2.2	1.2	2.4
99	0.405	0.834	0.531	2.5	1.2	1.9
100	0.169	0.593	0.243	5.9	1.7	4.1
101	0.283	0.691	0.340	3.5	1.4	2.9
102	0.231	0.785	0.233	4.3	1.3	4.3
103	0.139	0.539	0.233	7.2	1.9	4.3
104	0.282	0.780	0.327	3.5	1.3	3.1
105	0.437	0.825	0.521	2.3	1.2	1.9
106	0.212	0.648	0.221	4.7	1.5	4.5
107	0.272	0.746	0.386	3.7	1.3	2.6
108	0.339	0.811	0.601	3.0	1.2	1.7
109	0.329	0.892	0.306	3.0	1.1	3.3
110	0.209	0.731	0.273	4.8	1.4	3.7
111	0.352	0.837	0.594	2.8	1.2	1.7
112	0.224	0.679	0.357	4.5	1.5	2.8

113	0.455	0.906	0.359	2.2	1.1	2.8
114	0.317	0.772	0.448	3.2	1.3	2.2
115	0.504	0.853	0.479	2.0	1.2	2.1
116	0.237	0.710	0.264	4.2	1.4	3.8
117	0.201	0.583	0.218	5.0	1.7	4.6
118	0.158	0.528	0.326	6.3	1.9	3.1
119	0.133	0.508	0.311	7.5	2.0	3.2
120	0.357	0.796	0.433	2.8	1.3	2.3
121	0.179	0.594	0.288	5.6	1.7	3.5
122	0.248	0.772	0.429	4.0	1.3	2.3
123	0.182	0.566	0.307	5.5	1.8	3.3
124	0.189	0.546	0.204	5.3	1.8	4.9
125	0.182	0.606	0.212	5.5	1.7	4.7
126	0.293	0.739	0.463	3.4	1.4	2.2
127	0.205	0.598	0.360	4.9	1.7	2.8
128	0.374	0.821	0.493	2.7	1.2	2.0
129	0.226	0.717	0.471	4.4	1.4	2.1
130	0.304	0.789	0.447	3.3	1.3	2.2
131	0.203	0.697	0.173	4.9	1.4	5.8
132	0.317	0.701	0.403	3.2	1.4	2.5
133	0.126	0.529	0.244	8.0	1.9	4.1
134	0.270	0.718	0.315	3.7	1.4	3.2
135	0.256	0.682	0.410	3.9	1.5	2.4
136	0.210	0.657	0.359	4.8	1.5	2.8
137	0.276	0.768	0.333	3.6	1.3	3.0
138	0.144	0.548	0.301	6.9	1.8	3.3
139	0.208	0.658	0.306	4.8	1.5	3.3
140	0.234	0.760	0.435	4.3	1.3	2.3
141	0.156	0.537	0.313	6.4	1.9	3.2
142	0.136	0.514	0.276	7.4	1.9	3.6
143	0.115	0.615	0.407	8.7	1.6	2.5
144	0.139	0.591	0.378	7.2	1.7	2.6
145	0.151	0.617	0.279	6.6	1.6	3.6
146	0.171	0.584	0.311	5.8	1.7	3.2
147	0.139	0.637	0.197	7.2	1.6	5.1
148	0.080	0.389	0.171	12.5	2.6	5.9
149	0.231	0.750	0.237	4.3	1.3	4.2
150	0.237	0.751	0.329	4.2	1.3	3.0

* District 34 contains and wholly surrounds District 33.

Compactness Measures

Plan ID: PLANH205

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.254	0.844	0.608	3.9	1.2	1.6
2	0.299	0.773	0.425	3.3	1.3	2.4
3	0.301	0.854	0.580	3.3	1.2	1.7
4	0.182	0.737	0.293	5.5	1.4	3.4
5	0.282	0.823	0.344	3.5	1.2	2.9
6	0.214	0.749	0.323	4.7	1.3	3.1
7	0.233	0.642	0.421	4.3	1.6	2.4
8	0.246	0.816	0.557	4.1	1.2	1.8
9	0.169	0.706	0.337	5.9	1.4	3.0
10	0.208	0.754	0.314	4.8	1.3	3.2
11	0.309	0.840	0.492	3.2	1.2	2.0
12	0.145	0.672	0.349	6.9	1.5	2.9
13	0.210	0.749	0.413	4.8	1.3	2.4
14	0.158	0.634	0.312	6.3	1.6	3.2
15	0.216	0.664	0.238	4.6	1.5	4.2
16	0.313	0.793	0.484	3.2	1.3	2.1
17	0.323	0.776	0.459	3.1	1.3	2.2
18	0.290	0.737	0.283	3.4	1.4	3.5
19	0.113	0.672	0.476	8.8	1.5	2.1
20	0.427	0.849	0.548	2.3	1.2	1.8
21	0.149	0.679	0.429	6.7	1.5	2.3
22	0.169	0.651	0.336	5.9	1.5	3.0
23	0.349	0.785	0.302	2.9	1.3	3.3
24	0.242	0.695	0.336	4.1	1.4	3.0
25	0.438	0.891	0.330	2.3	1.1	3.0
26	0.125	0.579	0.245	8.0	1.7	4.1
27	0.203	0.650	0.148	4.9	1.5	6.7
28	0.212	0.787	0.459	4.7	1.3	2.2
29	0.280	0.760	0.467	3.6	1.3	2.1
30	0.227	0.731	0.455	4.4	1.4	2.2
31	0.163	0.606	0.234	6.1	1.7	4.3
32	0.188	0.705	0.266	5.3	1.4	3.8
33	0.180	0.695	0.353	5.6	1.4	2.8
34	0.195	0.557	0.228	5.1	1.8	4.4
35	0.110	0.529	0.295	9.1	1.9	3.4
36	0.209	0.710	0.347	4.8	1.4	2.9
37	0.249	0.755	0.498	4.0	1.3	2.0
38	0.129	0.692	0.379	7.7	1.4	2.6
39	0.288	0.802	0.454	3.5	1.2	2.2
40	0.196	0.590	0.287	5.1	1.7	3.5
41	0.303	0.723	0.385	3.3	1.4	2.6
42	0.174	0.601	0.368	5.8	1.7	2.7
43	0.268	0.687	0.404	3.7	1.5	2.5
44	0.443	0.839	0.426	2.3	1.2	2.3
45	0.545	0.830	0.438	1.8	1.2	2.3
46	0.201	0.753	0.523	5.0	1.3	1.9
47	0.262	0.846	0.278	3.8	1.2	3.6
48	0.142	0.566	0.241	7.0	1.8	4.1
49	0.165	0.589	0.165	6.1	1.7	6.1
50	0.145	0.644	0.271	6.9	1.6	3.7
51	0.343	0.826	0.498	2.9	1.2	2.0

52	0.258	0.617	0.329	3.9	1.6	3.0
53	0.286	0.737	0.415	3.5	1.4	2.4
54	0.281	0.754	0.441	3.6	1.3	2.3
55	0.084	0.447	0.111	11.9	2.2	9.0
56	0.196	0.754	0.398	5.1	1.3	2.5
57	0.187	0.692	0.399	5.4	1.4	2.5
58	0.433	0.852	0.473	2.3	1.2	2.1
59	0.205	0.629	0.286	4.9	1.6	3.5
60	0.387	0.746	0.466	2.6	1.3	2.1
61	0.390	0.712	0.396	2.6	1.4	2.5
62	0.269	0.798	0.384	3.7	1.3	2.6
63	0.408	0.789	0.364	2.5	1.3	2.7
64	0.251	0.632	0.250	4.0	1.6	4.0
65	0.392	0.760	0.408	2.5	1.3	2.5
66	0.527	0.858	0.565	1.9	1.2	1.8
67	0.235	0.689	0.301	4.3	1.5	3.3
68	0.221	0.639	0.279	4.5	1.6	3.6
69	0.419	0.869	0.460	2.4	1.2	2.2
70	0.467	0.843	0.495	2.1	1.2	2.0
71	0.261	0.642	0.360	3.8	1.6	2.8
72	0.249	0.651	0.392	4.0	1.5	2.6
73	0.258	0.722	0.223	3.9	1.4	4.5
74	0.180	0.613	0.347	5.6	1.6	2.9
75	0.525	0.897	0.528	1.9	1.1	1.9
76	0.334	0.713	0.417	3.0	1.4	2.4
77	0.180	0.537	0.234	5.6	1.9	4.3
78	0.357	0.801	0.465	2.8	1.2	2.1
79	0.409	0.884	0.343	2.4	1.1	2.9
80	0.655	0.896	0.577	1.5	1.1	1.7
81	0.235	0.741	0.288	4.3	1.4	3.5
82	0.253	0.692	0.383	3.9	1.4	2.6
83	0.264	0.753	0.394	3.8	1.3	2.5
84	0.042	0.342	0.173	23.9	2.9	5.8
85	0.778	0.993	0.629	1.3	1.0	1.6
86	0.383	0.804	0.440	2.6	1.2	2.3
87	0.349	0.803	0.520	2.9	1.2	1.9
88	0.128	0.693	0.263	7.8	1.4	3.8
89	0.255	0.739	0.354	3.9	1.4	2.8
90	0.192	0.631	0.435	5.2	1.6	2.3
91	0.222	0.718	0.286	4.5	1.4	3.5
92	0.261	0.702	0.429	3.8	1.4	2.3
93	0.097	0.529	0.139	10.4	1.9	7.2
94	0.125	0.574	0.322	8.0	1.7	3.1
95	0.139	0.630	0.255	7.2	1.6	3.9
96	0.396	0.818	0.558	2.5	1.2	1.8
97	0.269	0.780	0.443	3.7	1.3	2.3
98	0.318	0.744	0.340	3.1	1.3	2.9
99	0.473	0.908	0.510	2.1	1.1	2.0
100	0.131	0.556	0.241	7.7	1.8	4.2
101	0.177	0.643	0.199	5.6	1.6	5.0
102	0.352	0.753	0.464	2.8	1.3	2.2
103	0.120	0.609	0.316	8.3	1.6	3.2
104	0.238	0.639	0.325	4.2	1.6	3.1
105	0.286	0.780	0.473	3.5	1.3	2.1
106	0.363	0.805	0.428	2.8	1.2	2.3
107	0.236	0.609	0.364	4.2	1.6	2.7
108	0.250	0.773	0.471	4.0	1.3	2.1
109	0.187	0.756	0.250	5.3	1.3	4.0
110	0.187	0.707	0.372	5.3	1.4	2.7
111	0.148	0.581	0.288	6.8	1.7	3.5
112	0.253	0.767	0.260	3.9	1.3	3.8

113	0.154	0.580	0.194	6.5	1.7	5.2
114	0.310	0.757	0.462	3.2	1.3	2.2
115	0.200	0.637	0.291	5.0	1.6	3.4
116	0.295	0.782	0.423	3.4	1.3	2.4
117	0.424	0.834	0.426	2.4	1.2	2.3
118	0.179	0.606	0.337	5.6	1.7	3.0
119	0.123	0.467	0.315	8.1	2.1	3.2
120	0.287	0.732	0.522	3.5	1.4	1.9
121	0.191	0.657	0.435	5.2	1.5	2.3
122	0.234	0.757	0.360	4.3	1.3	2.8
123	0.208	0.663	0.414	4.8	1.5	2.4
124	0.134	0.502	0.208	7.4	2.0	4.8
125	0.193	0.596	0.289	5.2	1.7	3.5
126	0.272	0.734	0.435	3.7	1.4	2.3
127	0.193	0.592	0.312	5.2	1.7	3.2
128	0.096	0.565	0.265	10.4	1.8	3.8
129	0.193	0.689	0.510	5.2	1.5	2.0
130	0.240	0.791	0.400	4.2	1.3	2.5
131	0.228	0.761	0.338	4.4	1.3	3.0
132	0.272	0.772	0.242	3.7	1.3	4.1
133	0.292	0.686	0.349	3.4	1.5	2.9
134	0.229	0.726	0.567	4.4	1.4	1.8
135	0.228	0.717	0.555	4.4	1.4	1.8
136	0.453	0.853	0.510	2.2	1.2	2.0
137	0.167	0.618	0.366	6.0	1.6	2.7
138	0.134	0.493	0.276	7.4	2.0	3.6
139	0.222	0.675	0.298	4.5	1.5	3.4
140	0.332	0.755	0.442	3.0	1.3	2.3
141	0.237	0.657	0.339	4.2	1.5	2.9
142	0.164	0.553	0.325	6.1	1.8	3.1
143	0.121	0.597	0.241	8.3	1.7	4.1
144	0.317	0.765	0.519	3.2	1.3	1.9
145	0.256	0.700	0.238	3.9	1.4	4.2
146	0.171	0.544	0.291	5.8	1.8	3.4
147	0.202	0.714	0.343	4.9	1.4	2.9
148	0.390	0.829	0.546	2.6	1.2	1.8
149	0.279	0.664	0.236	3.6	1.5	4.2
150	0.236	0.749	0.452	4.2	1.3	2.2

Compactness Measures

Plan ID: PLANH283

	Standard 0->1 Calculation			Reciprocal Calculation		
District	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle	Perimeter to Area	Area to Rubber Band	Area to Smallest Circle
1	0.121	0.641	0.329	8.2	1.6	3.0
2	0.220	0.685	0.443	4.5	1.5	2.3
3	0.119	0.499	0.302	8.4	2.0	3.3
4	0.239	0.634	0.307	4.2	1.6	3.3
5	0.163	0.572	0.365	6.1	1.7	2.7
6	0.404	0.872	0.595	2.5	1.1	1.7
7	0.451	0.821	0.453	2.2	1.2	2.2
8	0.228	0.701	0.276	4.4	1.4	3.6
9	0.201	0.714	0.235	5.0	1.4	4.3
10	0.220	0.632	0.274	4.5	1.6	3.6
11	0.194	0.759	0.437	5.1	1.3	2.3
12	0.123	0.736	0.314	8.2	1.4	3.2
13	0.208	0.752	0.369	4.8	1.3	2.7
14	0.132	0.663	0.387	7.6	1.5	2.6
15	0.253	0.722	0.280	4.0	1.4	3.6
16	0.238	0.657	0.261	4.2	1.5	3.8
17	0.239	0.658	0.242	4.2	1.5	4.1
18	0.290	0.737	0.283	3.4	1.4	3.5
19	0.322	0.854	0.551	3.1	1.2	1.8
20	0.233	0.674	0.301	4.3	1.5	3.3
21	0.120	0.689	0.398	8.3	1.5	2.5
22	0.104	0.561	0.327	9.6	1.8	3.1
23	0.360	0.843	0.370	2.8	1.2	2.7
24	0.236	0.718	0.379	4.2	1.4	2.6
25	0.424	0.847	0.336	2.4	1.2	3.0
26	0.104	0.587	0.384	9.6	1.7	2.6
27	0.419	0.844	0.387	2.4	1.2	2.6
28	0.244	0.763	0.449	4.1	1.3	2.2
29	0.506	0.850	0.474	2.0	1.2	2.1
30	0.413	0.839	0.530	2.4	1.2	1.9
31	0.227	0.669	0.304	4.4	1.5	3.3
32	0.224	0.785	0.368	4.5	1.3	2.7
33	0.099	0.397	0.210	10.1	2.5	4.8
34	0.213	0.774	0.511	4.7	1.3	2.0
35	0.255	0.682	0.490	3.9	1.5	2.0
36	0.118	0.679	0.334	8.5	1.5	3.0
37	0.284	0.792	0.547	3.5	1.3	1.8
38	0.209	0.764	0.437	4.8	1.3	2.3
39	0.345	0.834	0.446	2.9	1.2	2.2
40	0.113	0.571	0.133	8.9	1.8	7.5
41	0.114	0.630	0.425	8.7	1.6	2.4
42	0.152	0.684	0.422	6.6	1.5	2.4
43	0.335	0.688	0.400	3.0	1.5	2.5
44	0.364	0.779	0.397	2.7	1.3	2.5
45	0.545	0.830	0.438	1.8	1.2	2.3
46	0.126	0.596	0.402	7.9	1.7	2.5
47	0.259	0.819	0.336	3.9	1.2	3.0
48	0.118	0.547	0.221	8.5	1.8	4.5
49	0.157	0.573	0.176	6.4	1.7	5.7
50	0.120	0.608	0.323	8.3	1.6	3.1
51	0.311	0.907	0.574	3.2	1.1	1.7

52	0.218	0.597	0.333	4.6	1.7	3.0
53	0.260	0.709	0.303	3.9	1.4	3.3
54	0.282	0.697	0.280	3.6	1.4	3.6
55	0.343	0.723	0.448	2.9	1.4	2.2
56	0.261	0.817	0.441	3.8	1.2	2.3
57	0.166	0.748	0.319	6.0	1.3	3.1
58	0.367	0.704	0.414	2.7	1.4	2.4
59	0.270	0.685	0.396	3.7	1.5	2.5
60	0.339	0.735	0.452	3.0	1.4	2.2
61	0.584	0.880	0.448	1.7	1.1	2.2
62	0.177	0.652	0.262	5.7	1.5	3.8
63	0.411	0.867	0.434	2.4	1.2	2.3
64	0.276	0.751	0.373	3.6	1.3	2.7
65	0.289	0.780	0.372	3.5	1.3	2.7
66	0.486	0.884	0.405	2.1	1.1	2.5
67	0.250	0.665	0.364	4.0	1.5	2.7
68	0.146	0.517	0.317	6.8	1.9	3.2
69	0.349	0.787	0.387	2.9	1.3	2.6
70	0.202	0.753	0.499	5.0	1.3	2.0
71	0.587	0.855	0.477	1.7	1.2	2.1
72	0.550	0.861	0.483	1.8	1.2	2.1
73	0.358	0.729	0.334	2.8	1.4	3.0
74	0.189	0.692	0.244	5.3	1.4	4.1
75	0.466	0.865	0.386	2.1	1.2	2.6
76	0.325	0.728	0.284	3.1	1.4	3.5
77	0.117	0.474	0.258	8.6	2.1	3.9
78	0.233	0.864	0.481	4.3	1.2	2.1
79	0.476	0.860	0.438	2.1	1.2	2.3
80	0.230	0.675	0.255	4.3	1.5	3.9
81	0.374	0.784	0.468	2.7	1.3	2.1
82	0.355	0.745	0.328	2.8	1.3	3.0
83	0.257	0.582	0.364	3.9	1.7	2.7
84	0.260	0.704	0.386	3.8	1.4	2.6
85	0.258	0.741	0.333	3.9	1.3	3.0
86	0.458	0.782	0.393	2.2	1.3	2.5
87	0.626	0.907	0.489	1.6	1.1	2.0
88	0.241	0.626	0.218	4.1	1.6	4.6
89	0.264	0.839	0.605	3.8	1.2	1.7
90	0.079	0.577	0.366	12.7	1.7	2.7
91	0.487	0.868	0.515	2.1	1.2	1.9
92	0.298	0.732	0.428	3.4	1.4	2.3
93	0.104	0.453	0.156	9.6	2.2	6.4
94	0.307	0.792	0.533	3.3	1.3	1.9
95	0.111	0.603	0.344	9.0	1.7	2.9
96	0.227	0.763	0.261	4.4	1.3	3.8
97	0.328	0.807	0.500	3.0	1.2	2.0
98	0.382	0.839	0.384	2.6	1.2	2.6
99	0.439	0.815	0.464	2.3	1.2	2.2
100	0.104	0.466	0.272	9.6	2.1	3.7
101	0.279	0.783	0.258	3.6	1.3	3.9
102	0.336	0.784	0.353	3.0	1.3	2.8
103	0.081	0.503	0.296	12.3	2.0	3.4
104	0.076	0.471	0.285	13.2	2.1	3.5
105	0.108	0.612	0.236	9.2	1.6	4.2
106	0.258	0.756	0.317	3.9	1.3	3.2
107	0.116	0.501	0.291	8.6	2.0	3.4
108	0.324	0.693	0.449	3.1	1.4	2.2
109	0.190	0.703	0.273	5.3	1.4	3.7
110	0.222	0.755	0.405	4.5	1.3	2.5
111	0.163	0.618	0.321	6.1	1.6	3.1
112	0.198	0.674	0.358	5.1	1.5	2.8

113	0.143	0.716	0.189	7.0	1.4	5.3
114	0.284	0.750	0.357	3.5	1.3	2.8
115	0.274	0.854	0.459	3.7	1.2	2.2
116	0.281	0.720	0.256	3.6	1.4	3.9
117	0.239	0.620	0.237	4.2	1.6	4.2
118	0.096	0.429	0.282	10.4	2.3	3.5
119	0.141	0.514	0.326	7.1	1.9	3.1
120	0.289	0.803	0.494	3.5	1.2	2.0
121	0.332	0.767	0.380	3.0	1.3	2.6
122	0.289	0.757	0.417	3.5	1.3	2.4
123	0.218	0.615	0.309	4.6	1.6	3.2
124	0.293	0.674	0.331	3.4	1.5	3.0
125	0.275	0.761	0.270	3.6	1.3	3.7
126	0.296	0.746	0.396	3.4	1.3	2.5
127	0.270	0.613	0.362	3.7	1.6	2.8
128	0.217	0.679	0.339	4.6	1.5	3.0
129	0.169	0.718	0.363	5.9	1.4	2.8
130	0.229	0.621	0.348	4.4	1.6	2.9
131	0.146	0.676	0.141	6.8	1.5	7.1
132	0.461	0.830	0.409	2.2	1.2	2.4
133	0.371	0.837	0.409	2.7	1.2	2.4
134	0.189	0.693	0.383	5.3	1.4	2.6
135	0.278	0.605	0.310	3.6	1.7	3.2
136	0.254	0.792	0.361	3.9	1.3	2.8
137	0.181	0.680	0.190	5.5	1.5	5.3
138	0.271	0.800	0.326	3.7	1.2	3.1
139	0.124	0.514	0.266	8.0	1.9	3.8
140	0.323	0.793	0.458	3.1	1.3	2.2
141	0.204	0.607	0.355	4.9	1.6	2.8
142	0.144	0.567	0.314	6.9	1.8	3.2
143	0.274	0.790	0.543	3.6	1.3	1.8
144	0.127	0.560	0.311	7.9	1.8	3.2
145	0.136	0.537	0.107	7.3	1.9	9.3
146	0.105	0.517	0.207	9.5	1.9	4.8
147	0.218	0.669	0.227	4.6	1.5	4.4
148	0.099	0.438	0.186	10.1	2.3	5.4
149	0.323	0.819	0.460	3.1	1.2	2.2
150	0.254	0.744	0.376	3.9	1.3	2.7